AT91SAM7X-EK Test Software

Revision Table:

Revision	Date	Comments
2.0	June 13, 2008	Initial release

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1 Hardware Requirements

Hardware Requirements:

AT91SAM7X-EK :		SAM-ICE :	
USB A/B Cable :		Ethernet cross cable :	
DataFlash Card:		Serial cross cable :	
COM port loop back plug :		PC with serial COM port (Windows2000/XP):	

2 Setting up

2.1 PC environment

2.1.1 SAM-ICE

SAM-ICE is a JTAG emulator designed for all Atmel AT91 ARM7/ARM9 cores. DLL files to support the SAM-ICE are delivered as a ZIP file containing the setup program.

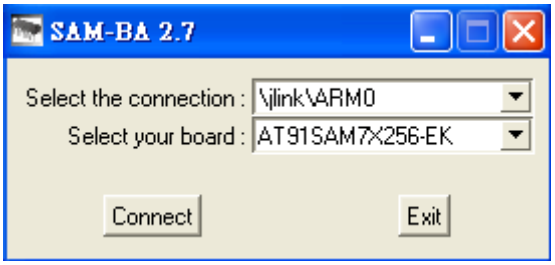
- In order to use SAM-ICE, please install ***Setup_JLinkARM_V380a.exe*** on your PC, available in ***Setup_JLinkARM_V380a.zip*** file provided with this document.

2.1.2 SAM-BA

SAM-BA (Boot Assistant) is one of the tools provided in ATMEL AT91 In-System Programming (ISP) solution. It provides an easy way for programming AT91 family microcontrollers using a graphical or command-line interface. It is also possible to create powerful scripts which can then be run via the command line, enabling the automation of many tasks. Those scripts can be hand written by the programmer or recorded through the graphical interface.

- During our test, we will need ***SAM-BA*** to program the testing board. So please install ***Install AT91-ISP v1.11.exe*** provided with this document.

  Note: any other version of SAM-BA previously installed on your PC should be removed.



2.2 AT91SAM7X-EK

2.2.1 Jumpers setting

- Before the test, Please make sure they are in default status.

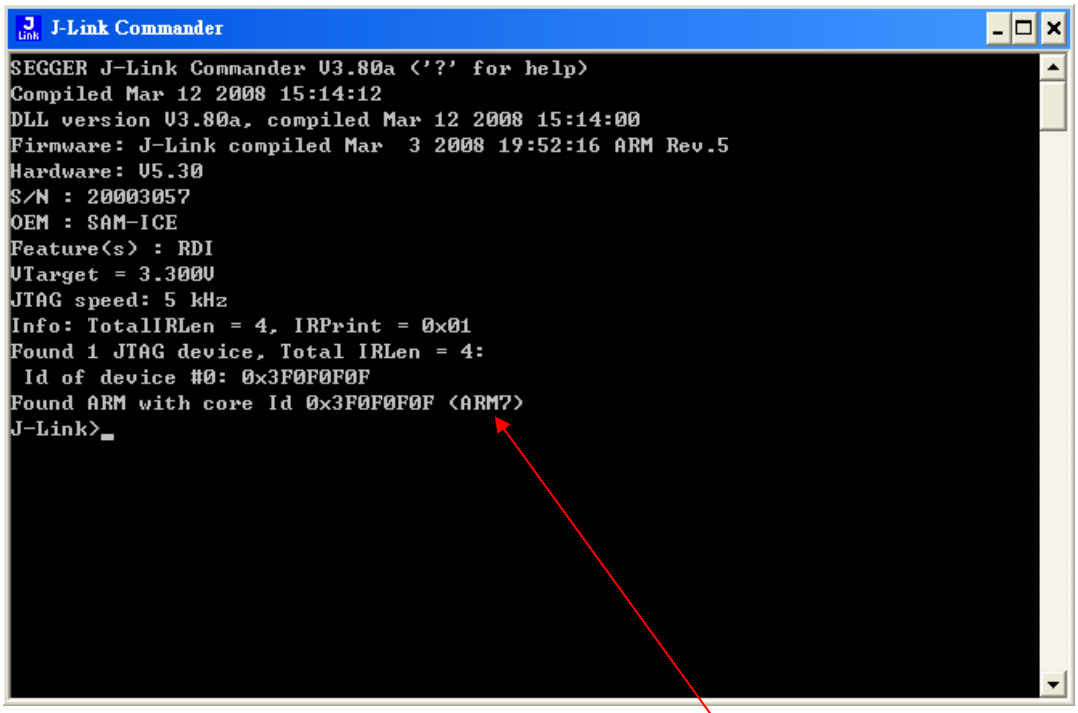
The table below gives details on Jumpers setting on the AT91SAM7X-EK board and their default settings.

Designation	Default Setting	Feature
J28	Closed	Enables Ethernet Auto MDIX control
J19	Closed	Enables the use of the NPCS00 (PA12).
J13	1-2	ADVREF Jumper select 1-2: 3.00V Voltage reference 2-3: VDDANA
J21	Closed	Enables 120 ohms CAN bus resistance termination.
J15	Closed	VDDIO Jumper
J11	Closed	VDDIN Jumper
J14	Closed	VDDCORE Jumper
J18	Closed	VDDPLL Jumper
J12	Closed	VDDFLASH Jumper
J8	Opened	Erases all internal Flash memory when the board is powered. To do that, the user will have to close the J8 at least 200 ms.

3 Testing the board

3.1 ICE Interface

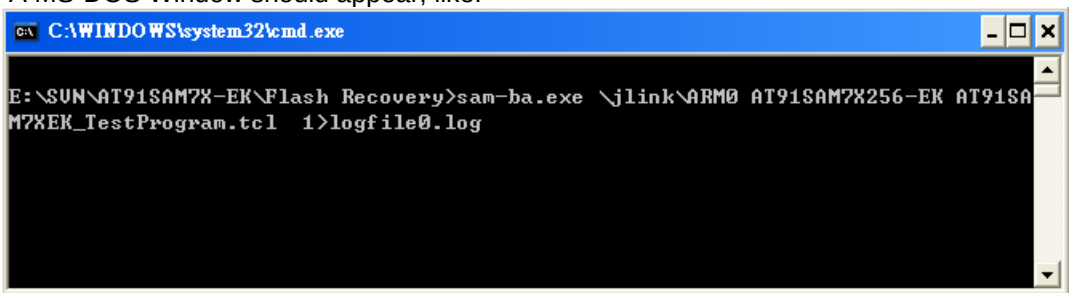
1. Connect the AT91SAM-ICE probe between the PC and an AT91SAM7X-EK Board.
2. Connect the Board to PC via USB A/B Cable.
3. Launch J-Link.exe by selecting: *Start > SEGGER > J-Link ARM V3.80a > J-Link Commander* on your PC.
4. A MS-DOS Window should appear with the results of the previous command:


J-Link Commander
SEGGER J-Link Commander V3.80a ('?' for help)
Compiled Mar 12 2008 15:14:12
DLL version V3.80a, compiled Mar 12 2008 15:14:00
Firmware: J-Link compiled Mar 3 2008 19:52:16 ARM Rev.5
Hardware: V5.30
S/N : 20003057
OEM : SAM-ICE
Feature(s) : RDI
VTarget = 3.300V
JTAG speed: 5 kHz
Info: TotalIRLen = 4, IRPrint = 0x01
Found 1 JTAG device, Total IRLen = 4:
Id of device #0: 0x3F0F0F0F
Found ARM with core Id 0x3F0F0F0F (ARM7)
J-Link>

5. Make sure the test is successful and detect the core as an ARM7.
6. Close the window.

3.2 Flash recovery

1. Extract AT91SAM7X-EK Test Software Package file provided with this user guide.
2. Launch *AT91SAM7XEK_TestProgram.bat* by double-click on it under: *\ Flash Recovery.*
3. A MS-DOS Window should appear, like:



4. Wait and verify the board have been programmed correctly when logfile.log appear at the end of programming.

```
-I- Waiting ...
connection : \jlink\ARM0
board : AT91SAM7X256-EK
target(handle) : 19571544
read chip ID : 0x00000000 at addr: 0xFFFFEE40
read chip ID : 0x275B0940 at addr: 0xFFFFF240
-I- Found processor : AT91SAM7X256 (0x275B0940)
-I- Loading applet isp-flash-at91sam7x256.bin at address 0x202000
-I- Memory Size : 0x40000 bytes
-I- Buffer address : 0x2027A8
-I- Buffer size: 0xD600 bytes
-I- Applet initialization done
-I- FLASH initialized
script file : AT91SAM7XEK_TestProgram.tcl
-I- === Erase all the Flash ===
-I- GENERIC::EraseAll
-I- Sector 0 unlocked
-I- Sector 1 unlocked
-I- Sector 2 unlocked
-I- Sector 3 unlocked
-I- Sector 4 unlocked
-I- Sector 5 unlocked
-I- Sector 6 unlocked
-I- Sector 7 unlocked
-I- Sector 8 unlocked
-I- Sector 9 unlocked
-I- Sector 10 unlocked
-I- Sector 11 unlocked
-I- Sector 12 unlocked
-I- Sector 13 unlocked
-I- Sector 14 unlocked
-I- Sector 15 unlocked
-I- GENERIC::EraseAll
-I- === Send Bin file into Flash ===
-I- Send File ./MouseUSB.bin at address 0x100000
 first_sector 0 last_sector 0
-I-     Writing: 0x25EC bytes at 0x0 (buffer addr : 0x2027A8)
-I-     0x25EC bytes written by applet
-I- Sector 0 locked
-I- === Chang GPNVM2 to Boot from Flash===
-I- GPNVM2 set
-I- === End of Flash programming ===
```

5. Close the window.
6. Disconnects the SAM-ICE.
7. Disconnects USB link.

3.3 The Test Software

1. Connect serial cross cable between the board and PC COM port
2. Open hyper terminal console on PC (115200, 8, N, 1).
3. Connects USB link: the Mouse Application will execute. The following message is displayed onto the HyperTerminal:

```
=====================================
USB Mouse Application started!!!
=====================================
```

This application allows validating USB connection, the User LEDs and the Joystick.The first time, a new USB driver must be recognized by Windows and automatically installed.

The first User LED (DS1) must switch on. Once the USB pull up is detected, the three remaining User LEDsmust switch on. If the first User LED does not switch on, there may be a problem either on the LEDconnection, or the software test was not downloaded correctly. If the three remaining User LEDs does not switch on, there may be a problem either on the LEDs connection, or on the USB pull-up connection.

Move the cursor thanks to the joystick to left, right up and down. Then press it: all the User LEDs must switch off. If it does not work correctly, there may be a problem on the Joystick connections.

4. Hit a key on the HyperTerminal, this will end the Mouse Application and enter the second part of the tests.
   Check that DBGU is OK. Power and USER LEDs are blinking.

```
=====================================
AT91SAM7X-EK Test BOARD
=====================================
-I- Step 1. DBGU Interface: Test OK
-I- Step 2. Power and USER LEDs must blink !
Hit a key to stop the LEDs test!
```

5. Connect Loopback plug onto COM Port and loop back into the J26 connector between pin 1 and pin 2.
   Hit any key on keyboard to start the test.

6. Check COM Port is OK.
   Check measurement on AD4 and AD5 = 1.5V +/- 50mV.
   Check DataFlash device is OK.

```
-I- Step 3. RS232 COM Port Test
-I- Test OK
-I- Step 4. Test ADC & PWM Interfaces: Wait during measurements...
        Analog Input (ADC Channel 4) = 1504 mV
        PWMC5 Output (ADC Channel 5) = 1507 mV
-I- Step 5. Test SPI0 & DataFlash Device
-I- Test OK
```

7. Insert the DataFlash Card into *slot J30* on the top side of the board.
   Hit any key on keyboard to start the test.

```
-I- Step 6. Test SPI0 & DataFlash Card
-I- Please insert a DataFlash Card. Hit a key when ready...
-I- Test OK
```

8. Connect the board (testing) to another AT91SAM7X-EK board containing a specific CAN BUS test program.
   Note 1: J21 must be closed.
   2: J20 connection between two boards. (1<--> 1, 2<-->2, 3<-->3.)
   Hit any key on keyboard to start the test.

   -I- Step 7. Test CAN Interface:
   -I- Please connect the CAN Master board. Hit a key when ready...
   -I- Test OK

9. Set your PC IP address as: **10.159.245.8**.

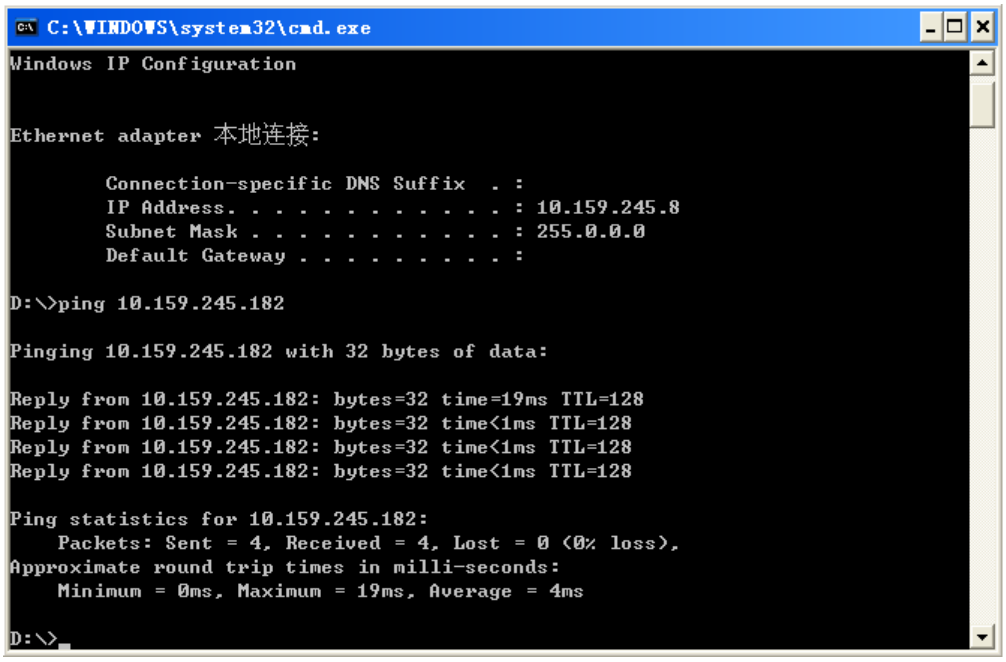
10. Connect the board to PC Ethernet plug via crossed/straight Ethernet cable.

    -I- Step 8. EMACB Test

    EMAC Init : 100 Mbit/s FULL DUPLEX

    Open a DOS Window and type:
    ping 10.159.245.182
    Hit a key to start the test and another to stop it...

    Hit any key on keyboard to start the test.
    Open a DOS Window on PC and type "**ping 10.159.245.182**", then the testing board will answer the request.



    ==========
    END OF TESTS
    ==========
    Hit a key to restart the Tests

11. Test RESET button on board.

    The manual reset (BP2) is used to reset the board at the end of the tests. This must allow displaying the Mouse Application starting message.

    Congratulation!!! You have finished the test for the AT91SAM7X-EK.